### GENERAL ASPECTS RELATED TO COMPUTING AND USAGE OF THE RATE OF RETURN IN THE ANALYSES OF THE PRIVATELY MANAGE PENSION FUNDS IN ROMANIA

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### Abstract

The private pension system in Romanian is composed by privately managed pension funds (Pillar II) and voluntary pension funds (Pillar III). The rate of return of the private pension funds is of upmost importance, in the sense that it gives to the future pensioners the prospect of increasing the accumulated assets from their personal accounts. The amounts are invested by the pension funds management companies with the purpose of increasing the value of the assets of the participants. The activity of these companies is permanently monitor and analyse by the national financial supervisory authority based on the following indicators: the rate of return of a privately managed pension funds, the weighted average rate of return of all privately managed pension funds, the adjusted weighted average rate of return of all privately managed pension funds and the minimum rate of return of all privately managed pension funds from the same risk class.

**Keywords**: rate of return, Pillar II, private pension funds, assets, investments

JEL Classification: G12, J32, O16

### Introduction

The private pension system, via it components privatly managet pensions (Pillar II) and voluntary pensions (Pillar III), is part of the Romanian pension system, aimed at ensuring a private, distinct pension, which supplements the pension granted by the public system. The implementation of the private pension system is an important stage in the pension reform that aims to remove the pressure on the public pension system, pressure generated by the predicted demographic evolutions: aging population, decrease of birth rate and decrease of the active labor force. According to the forecasts, a substantial increase in the number of pensioners is expected and a decrease

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of the number of employees, mening that the amounts with which employees will contribute to social insurance will have a tendency to decrease, while the amounts to be paid to the pensioners will increase. At the same time, life expectancy is expected to increase due to advances in medicine and technological development, making the Government even more responsible for finding sustainable solutions to ensure decent living standards for the population after retirement.

### 1. Literature review

Anghelache and Anghel (2019) highlighted the main statistical indicators used in the economic analyzes. Bewerunge and Rosen (2013) conducted a comparative study on the correlation between the level of salaries and pensions in the public and private sectors. Ramoni-Perazzi and Bellante (2007) treated a similar theme. Creedy and Guest (2008) analyzed the macroeconomic impact of private pension taxation. Hyde and Dixon (2009) conducted a transnational comparative analysis of mandatory private pensions. Foster (2015) emphasized the need for people to plan and contribute from an early age to retirement. Gittleman and Brooks (2012) addressed a number of issues regarding central and local government employees. Hasegan (2019) conducted an analysis of the emergence and evolution of the Pillar II system. O'Rand, Ebel and Isaacs (2009) analyzed the private pension system from an international perspective. A similar subject is approached by Orenstein (2008), emphasizing the situation found in Central and Eastern Europe. Van Rooij, Kool and Prast (2007) analyzed the relationship between profitability and risk in the private pensions market.

# 2. Research methodology, data and hypothesesGeneral guidelines regarding the privately managed pension system (Pillar II)

The legal framework governing Pillar II is represented by Law no. 411/2004 regarding the privately managed pension funds, republished, with subsequent amendments and completions, which provides compulsory contributions for persons up to 35 years old and optional for those aged between 35 and 45, in the quota of 3.75% of the gross salary income. Within 4 months from the fulfillment of the legal conditions, the eligible persons must choose their privately managed pension fund, which they consider appropriate, to which they will adhere. The decision is based on prospecting the market and analyzing / consulting the prospectuses of privately managed pension funds mainly regarding on investment policy, risk management, commissions.

Persons who have exceeded the specified term will be randomly assigned to a privately managed pension fund by the record institution, respectively by the National House of Public Pensions (CNPP).

By signing the individual act of adhesion and validating it by the CNPP, the persons become participant and will contribute to the pension fund for the entire time period for which the social insurance contribution to the public pension system is due, until the right to private pension is opened. During this period, if considered appropriate, the participant has the opportunity to transfer to another privately managed pension fund, without penalties, if at least two years have passed since the accession or the previous transfer. We emphasize that the participant does not have the right to contribute to more then one privately managed pension funds at the same time.

Each participant has an individual account in which his contributions are transferred, being the owner of the personal assets of his own account. Every year, the pension management company communicate to the participants, through written correspondence and free of charge, the main information regarding the personal assets and the situation of the pension management company. Any additional data can be requested whenever necessary for a fee.

On June 30, 2019, 7.34 million participants were registered. The evolution of the number of participants in the period 2008-2018 is highlighted in the following figure:





Source: own representation based on data published by Romanian Financial Supervisory Authority

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On 30.06.2019, the average value of an account, was 7,631 lei, increasing compared to the previous year.

Pillar II in Romania is defined contributions type, which means that the level of the pension the participants will receive depends on the investment result obtained by the pension management companies, the participants being the ones who bear the investment risk, specific to the financial sector. In order to prevent the deterioration of the assets of the privately managed pension funds, the legislator has set investment limits and qualitative requirements for the assets, and also in order to protect the personal assets, specific guarantees have been established. Moreover, according to the law, a pension fund cannot be declared bankrupt.

Regarding the allocation of resources on different asset classes, at the end of June 2019, the highest weights are related to government securities, shares, bank deposits and municipal bonds. The assets of Pillar II were invested in Romania (85.67%) and the difference in the European Union and in the European Economic Area. Thus, the fund managers invest in Romanian financial instruments like government securities, deposits, bonds and UCITS. The foreign assets in which they invests are represented by financial instruments from Luxembourg, France, Germany, the Netherlands or bonds issued by EBRD, EIB, etc. Of the total investments in foreign currency, the highest weight, 7.51%, is held by the euro, followed by the US dollar.

## • The main statistical indicators used in the analysis of the privately managed pension funds

In order to carry out a relevant analysis of the economic phenomena, including those specific to the private pensions market, a set of indicators can be used, based on which the overall tendency of the data is determined. In this sense, in the literature, several statistical indicators have been defined to calculate both the variation of the terms of the series in absolut and/or relative size, as well as the average values that characterise it.

In order to analyze the profitability of privately managed pension funds, in accordance with the legal provisions in force, the statistical indicators are: the rate of return of each privately managed pension fund for the last 24 months; the weighted average rate of return of all privately managed pension funds, calculated for the last 24 months; the minimum rate of return of all privately managed pension funds. The abovementioned indicators are calculated both by the pension management companies and by the Romanian Financial Supervisory Authority.

From the methodological point of view, the terms used in the calculation of the profitability indicators, according to the rules of the Financial

Supervisory Authority, have the following meaning: the weighted average rate of return of all privately managed pension funds is determined as the sum of the products between the annualized rate of return of the each pension fund and the adjusted weighted average of the pension fund in the total of privately managed pension funds, over a certain period of time. The adjusted weighted average of a privately managed pension fund is the average weight calculated by adjusting the average weights of privately managed pension funds by limiting the average weight of each fund to the threshold of 20% and the proportional redistribution of the surplus resulting to the other pension funds below the 20% threshold.

> The rate of return of a privately managed pension fund over a certain period is calculated according to the following relationship:

$$r_{rFP_{i}} = \frac{VU_{FP_{i(t)}} - VU_{FP_{i(t-1)}}}{VU_{FP_{i(t-1)}}}$$
(1)

where:

 $r_{rFPi}$  = the rate of return of the privately managed pension fund "i" over a certain period of time "t"

 $VU_{FP(t)}$  = the value of the fund unit of the pension fund "i" from the last business day of the time period "t";

 $VU_{FP(t-1)}$  = the value of the fund unit of the pension fund "i" from the last business day of the time period "t-1".

> By daily return of a privately managed pension fund, we mean the value obtained from the difference between the value of the fund unit of that day and its value from the previous day, divided by the latter. The calculation is performed using the relation:

$$\eta_{zFP_{i}} = \frac{VU_{FP_{i(j)}} - VU_{FP_{i(j-1)}}}{VU_{FP_{i(j-1)}}}$$
where:
(2)

 $\eta_{rFPi}$  = daily return of the pension fund "i";

 $VU_{FPi(i)}$  = the value of the pension fund unit "i" on day "j";

 $VU_{FPi(j-1)} =$  the value of the pension fund unit "i" on the previous day "j-1".

> The daily weight of a privately managed pension fund is obtained by divideing the value of the net assets of the pension fund to the sum of the net assets of all pension funds, from the moment of calculation. The formula is:

$$\% FP_{z(i)} = \frac{AN_{FP_{(i(j))}}}{\sum_{i=1}^{n} AN_{FP_{(i(j))}}}$$
(3)

where:

 $%FP_{z(i)}$  = the daily share of the pension fund "i" in the total of the privately managed pension funds;

 $AN_{FP(i(j))}$  = the value of the net assets of the pension fund "i" on day "j"; n = the total number of privately managed pension funds.

> The annualized rate of return of a privately managed pension fund takes into account the results of the last 24 months, using in this respect the relationship:

$$r_{r_a}^{FP_i} = \sqrt{1 + r_{r_{24}}^{FP_i}} - 1 \tag{4}$$

where:

 $r_{ra}^{Fpi}$  = the annualized rate of return of the privately managed pension fund "i" measured for the period of the last 24 months prior to the calculation;  $r_{r24}^{Fpi}$  = the rate of return of the privately managed pension fund "i"

measured for the period of the last 24 months prior to the calculation.

> The weighted average rate of return of all privately managed pension funds represents the sum of the products between the annualized rate of return of each pension fund and the average weight of the pension fund in the total of privately managed pension funds, over a period, using the relation:

$$\bar{r}_{r}^{FP} = \sum_{i=1}^{n} r_{r_{a}}^{FP_{i}} \cdot \overline{\mathscr{W}FP_{i}}$$
(5)
where:

 $\bar{r}_r^{FP}$  = the weighted average rate of return of all privately managed pension funds over a period;

n = the total number of privately managed pension funds;

 $r_{ra}^{Fpi}$  = the annulaised rate of return of the privately managed pension fund "i" measured over a period;

 $rac{96FP_i}{=}$  the average weight of the pension fund "i" in the total of the privately managed pension funds, which is determined as an arithmetic mean of the daily weights of the pension fund for the period considered, applying the following relation:

$$\overline{\%FP_{i}} = \frac{\sum_{t=1}^{n} \%FP_{z(i)}}{n_{z}} \tag{6}$$

where:

 $\sqrt[9]{FP_i}$  = the average share of the pension fund "i" over a certain period of time;

 $%FP_{z(i)}$  = the daily weights of the pension fund "i" in the total of the privately managed pension funds, for the respective period;

 $n_z$  = the number of working days of the period for which the calculation is made.

In order to calculate the adjusted average weight of a privately managed pension fund that is below the 20% threshold, the average weight of the fund is taken into account and also the sum of the average weights of all pension funds below the 20% threshold, the number of funds with the average weight greater than or equal to 20%, as well as the 20% threshold, using the following relation:

$$\overline{\mathscr{W}FP}_{\iota(aj)} = \frac{\mathscr{W}FP_{(\iota)}}{\sum_{i=1}^{n_1} \overline{\mathscr{W}FP}_{(\iota)<20\%}} \cdot \left[ (1 - p_r \cdot n_2) \right]$$
(7)

where:

 $\sqrt[n]{6}FP_{i(a)}$  = the average adjusted weight of the privately managed pension fund "i";

 $%FP_{(i)}$  = the average share of the pension fund "i" in the total of privately managed pension funds;

 $\overline{\%FP_{(i)<20\%}}$  = the average share of the pension fund "i" below the 20% threshold;

 $p_{r\,=}$  the threshold set at 20% as the maximum value of the average weight of a fund;

 $n_1$  = number of funds whose average weight is below the 20% threshold;

 $n_2$  = the number of funds whose average weight is greater than or equal to the 20% threshold.

Another important indicator used in the analysis of privately managed pension funds is the weighted average rate of return of all privately managed pension funds. This is calculated by applying the next relation:

$$\bar{r}_{r(aj)}^{FP} = \sum_{i=1}^{n} r_{r_a}^{FP_i} \cdot \overline{\mathscr{N}}FP_{\iota(aj)}$$
(8)

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where:

 $\bar{r}_{r(aj)}^{FP}$  = the weighted average rate of return of all privately managed pension funds over a period;

n = the total number of privately managed pension funds;

 $r_{ra}^{Fpi}$  = the annualized rate of return of the privately managed pension fund "i" measured over a period;

 $\% FP_{i(aj)}$  = the adjusted average weight of the pension fund "i" in the total of the privately managed pension funds.

The minimum rate of return of privately managed pension funds is determined for each category of risk. Thus, we calculate the minimum rate of return of all high risk funds representing the lowest value of the weighted average rate of adjusted return of all pension funds during the period analyzed, decreased by 5% and 40% of the adjusted weighted average rate of return of all pension funds, from the same period. For the calculation of this indicator we use the relation:

$$r_{r(\min\_R)} = \min(\bar{r}_{r(aj)}^{FP} - 0.05; 0.4 \cdot \bar{r}_{r(aj)}^{FP})$$
where:
(9)

 $r_{r(\min_R)}$  = the minimum rate of return of all privately managed pension funds, with high risk;

 $\vec{r}_{r(aj)}^{FP}$  = the adjusted weighted average rate of return of all privately managed pension funds.

Also, the minimum rate of return of all funds with medium risk is the smallest value of the weighted average rate of return of all pension funds during the period under analysis, decreased by 4% and 50% of the adjusted weighted average rate of return of all pension funds, in the same period. To determine this indicator we use the relation:

$$r_{r(\min_{M})} = \min(\bar{r}_{r(aj)}^{FP} - 0.04; 0.5 \cdot \bar{r}_{r(aj)}^{FP})$$
(10)

where:

 $r_{r(min_M)}$  = the minimum rate of return of all privately managed pension funds, with medium risk;

 $\bar{r}_{r(aj)}^{FP}$  = the adjusted weighted average rate of return of all privately managed pension funds.

To determine the minimum rate of return of all low risk funds we use the lowest value of the weighted average rate of return of all pension funds in the analyzed period, decreased by 3% and 60% of the adjusted weighted average rate of return of all pension funds, as presented in the formula below:

$$r_{r(\min\_S)} = \min(\bar{r}_{r(aj)}^{FP} - 0.03; 0.6 \cdot \bar{r}_{r(aj)}^{FP})$$
(11)  
where:

 $r_{r(min\_S)}$  = the minimum rate of return of all privately managed pension funds, with low risk;

 $\vec{r}_{r(aj)}^{FP}$  = the adjusted weighted average rate of return of all privately managed pension funds.

Currently, in Romania, out of the seven existing privately managed pension funds, six are classified in the medium risk category. The minimum rate of return of funds in this risk category was 2.2074% in November 2019, while the weighted average rate of return of all private pension funds for the last 24 months was 6.175%. The annualized rate of return recorded by these funds was in the range 5.5138% - 6.7589%. For the only high risk fund registered, the annualized rate of return was 5.8812%. in the same month. The minimum rate of return for this risk category was 1.2074%, while the weighted average rate of return of all private pension funds for the last 24 months was 6.175%.

### Conclusions

The performance of investments made by privately managed pension funds is measured using indicators that reflect the rate of return of the pension funds calculated quarterly. In the context of efficient management, the rates of return must be compared with the minimum requirement of profitability related to the degree of risk of each fund. Since the inception of the system, no private pension fund has recorded a rate of return below the minimum rate for its risk category.

In addition to the important social role of Pillar II in Romania, an additional benefit of the system is the formation of domestic capital and its investments in the national economy. Pillar II is in the accumulation period, in which the number of participants and the volume of assets is increasing and the exits from the system are relatively rare.

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